



HadISST.2.1.0.0: The Met Office Hadley Centre Sea Ice and Sea-Surface Temperature data set

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The latest version of the Met Office Hadley Centre sea-ice concentration and Sea-Surface Temperature data set, HadISST.2.1.0.0, builds on the successful elements of HadISST1. It blends multiple satellite and in situ sources to create a globally complete, homogeneous record of SST from 1850 to the present and features the following innovations:

1. Improvements to source data sets: HadISST2 is based on version 2.5 of the International Comprehensive Ocean Atmosphere Data Set (ICOADS), which contains several million more observations than the in situ data set on which HadISST1 was based. Improved AVHRR data from version 5 of the Pathfinder data set were used, as were SSTs from the ATSR Reanalysis for Climate (ARC) data set. Sea ice data sources have also been updated and extended.
2. Bias corrections: more comprehensive homogeneity adjustments are applied to the in situ SST, AVHRR SST and sea ice retrievals to correct for known biases in the data. The ATSR data come from ARC (ATSR Reprocessing for Climate) which has proven low uncertainty. A new 1000-member ensemble of in situ SST data sets allows for smooth matching between the in situ and ARC records.
3. Marginal Sea-Ice Zone SST's are now better specified by using improved satellite SSTs and accounting for climatological differences in sea-surface salinity.
4. Improved reconstruction techniques allow us to make use of every single observation to inform the estimation of the data covariances and reconstruction. These techniques also mean that we can make multiple reconstructions of the data at a resolution of 1 degree monthly all the way back to 1850 and with 5-day resolution back to 1961. By separately analysing large and small scale structures, fine scale features that are supported in the data are preserved.
5. Increased resolution: the base SST climatology is now 0.25x0.25 degrees and daily resolution allowing improved representation of features such as the Gulf Stream.
6. Uncertainties: HadISST2 is presented as a set of interchangeable realisations. These explore the uncertainty range associated with data biases and analysis uncertainty. Each realisation has realistic and more homogeneous spatial variability that is consistent with the known covariance structure of SST, the available observations and their uncertainties.